MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2022/2023

BFN3144 – FINANCIAL DERIVATIVES

(All sections / Groups)

11 JULY 2023
9:00 a.m – 11:00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This paper consists of 4 pages with 4 questions (excluding the cover page).
2. Attempt **ALL** questions. The distribution of the marks for each question is given.
3. Students are allowed to use non-programmable scientific and financial calculators.
4. Please write all your answers in the Answer Booklet provided.

Answer ALL questions in the answer booklet provided.

QUESTION 1

a) The futures contract is the evolution of forward contract, illustrate at least **THREE (3)** reasons why futures contract is developed?

(15 marks)

b) Mr. Muhammad is currently holding a portfolio of stocks worth RM1,650,000. He wishes to hedge his portfolio. The following information as below:

Portfolio beta	:	1.40
Spot index value	:	1400 points
Risk-free rate	:	5% per year
3-month SIF contract	:	1450
Expected dividend yields	:	0%

i) Compute the number of contracts you need to fully hedge your portfolio?

(5 marks)

ii) Illustrate and rationalise Mr. Muhammad's strategy using the Stock Index Futures (SIF).

(5 marks)

(Total: 25 marks)

Continued ...

QUESTION 2

a) Due to the recent financial institutions collapse in the United States, below is the information:

90 days KLIBOR rate : 7.20%
180 days KLIBOR rate : 8.50%
180 days KLIBOR futures: 90.50

It is expected that the KLIBOR futures will converge at the maturity. Assume that you can borrow or lend RM 1,000,000.

i) Illustrate how you can determine whether an arbitrage exists. Determine the correct price.

(8 marks)

b) Airfly Berhad is expected to borrow RM 200,000,000 from Maycc Bank in the next 3 months. Airfly Berhad believed that the interest rate will increase by 2% over the 3-month period. It is assumed convergence happened at the time of maturity. The current quotation as per below.

1-month KLIBOR	=	4.80 %
3-month KLIBOR	=	5.00 %
Spot-month KLIBOR	=	95
3-month KLIBOR futures	=	94

You are required to compute the annualised effective cost in percentage. Finalised your answer in sentence.

(17 marks)

(Total: 25 marks)

Continued ...

QUESTION 3

The recent US Silicon Valley Bank's financial distress has caused the great uncertainty in the financial market. You have formed a portfolio of stocks when the FBM KLCI stood at 1,450 points on July 1, 2023. Hence, as a professional trader, you have been instructed to come out with the best strategy to earn unlimited profit and limited loss. The following FTSE Bursa Malaysia KLCI Futures (FKLI) are available.

3 months 1,350 points FBM KLCI call options @ 70 points
3 months 1,450 points FBM KLCI call options @ 50 points
3 months 1,650 points FBM KLCI call options @ 30 points
3 months 1,350 points FBM KLCI put options @ 70 points
3 months 1,450 points FBM KLCI put options @ 50 points
3 months 1,650 points FBM KLCI put options @ 30 points

(a) Construct the strategy and name it. Supports your answer with payoff table and payoff graph by showing the limited loss and the breakeven points. Interval of 50 points should be tabulated. Rationalize the said strategy.

(25 marks)

QUESTION 4

a) TM Berhad currently is valued at RM 5 and the price can move up and down by 16% over 1-period. You believe the probability of an up movement should be 70%. The risk free interest rate is 10%. By using one-period binomial option pricing model:

i) Compute the possible stock price for next period.

(5 marks)

ii) Compute the intrinsic values for both call and put options given the strike price is RM 5.

(4 marks)

iii) Compute the value of call options and put options.

(8 marks)

b) Hedge fund managers prefer to use options contracts in their hedging strategies. Illustrate the at least **FOUR (4)** reasons why options contracts remained the focus.

(8 marks)

Continued ...

Table: Cumulative Normal Distribution

d	$N(d)$	d	$N(d)$	d	$N(d)$	d	$N(d)$	d	$N(d)$	d	$N(d)$
−3.00	.0013	−1.58	.0571	−0.76	.2236	0.06	.5239	0.86	.8051	1.66	.9515
−2.95	.0016	−1.56	.0594	−0.74	.2297	0.08	.5319	0.88	.8106	1.68	.9535
−2.90	.0019	−1.54	.0618	−0.72	.2358	0.10	.5398	0.90	.8159	1.70	.9554
−2.85	.0022	−1.52	.0643	−0.70	.2420	0.12	.5478	0.92	.8212	1.72	.9573
−2.80	.0026	−1.50	.0668	−0.68	.2483	0.14	.5557	0.94	.8264	1.74	.9591
−2.75	.0030	−1.48	.0694	−0.66	.2546	0.16	.5636	0.96	.8315	1.76	.9608
−2.70	.0035	−1.46	.0721	−0.64	.2611	0.18	.5714	0.98	.8365	1.78	.9625
−2.65	.0040	−1.44	.0749	−0.62	.2676	0.20	.5793	1.00	.8414	1.80	.9641
−2.60	.0047	−1.42	.0778	−0.60	.2743	0.22	.5871	1.02	.8461	1.82	.9656
−2.55	.0054	−1.40	.0808	−0.58	.2810	0.24	.5948	1.04	.8508	1.84	.9671
−2.50	.0062	−1.38	.0838	−0.56	.2877	0.26	.6026	1.06	.8554	1.86	.9686
−2.45	.0071	−1.36	.0869	−0.54	.2946	0.28	.6103	1.08	.8599	1.88	.9699
−2.40	.0082	−1.34	.0901	−0.52	.3015	0.30	.6179	1.10	.8643	1.90	.9713
−2.35	.0094	−1.32	.0934	−0.50	.3085	0.32	.6255	1.12	.8686	1.92	.9726
−2.30	.0107	−1.30	.0968	−0.48	.3156	0.34	.6331	1.14	.8729	1.94	.9738
−2.25	.0122	−1.28	.1003	−0.46	.3228	0.36	.6406	1.16	.8770	1.96	.9750
−2.20	.0139	−1.26	.1038	−0.44	.3300	0.38	.6480	1.18	.8810	1.98	.9761
−2.15	.0158	−1.24	.1075	−0.42	.3373	0.40	.6554	1.20	.8849	2.00	.9772
−2.10	.0179	−1.22	.1112	−0.40	.3446	0.42	.6628	1.22	.8888	2.05	.9798
−2.05	.0202	−1.20	.1151	−0.38	.3520	0.44	.6700	1.24	.8925	2.10	.9821
−2.00	.0228	−1.18	.1190	−0.36	.3594	0.46	.6773	1.26	.8962	2.15	.9842
−1.98	.0239	−1.16	.1230	−0.34	.3669	0.48	.6844	1.28	.8997	2.20	.9861
−1.96	.0250	−1.14	.1271	−0.32	.3745	0.50	.6915	1.30	.9032	2.25	.9878
−1.94	.0262	−1.12	.1314	−0.30	.3821	0.52	.6985	1.32	.9066	2.30	.9893
−1.92	.0274	−1.10	.1357	−0.28	.3897	0.54	.7054	1.34	.9099	2.35	.9906
−1.90	.0287	−1.08	.1401	−0.26	.3974	0.56	.7123	1.36	.9131	2.40	.9918
−1.88	.0301	−1.06	.1446	−0.24	.4052	0.58	.7191	1.38	.9162	2.45	.9929
−1.86	.0314	−1.04	.1492	−0.22	.4129	0.60	.7258	1.40	.9192	2.50	.9938
−1.84	.0329	−1.02	.1539	−0.20	.4207	0.62	.7324	1.42	.9222	2.55	.9946
−1.82	.0344	−1.00	.1587	−0.18	.4286	0.64	.7389	1.44	.9251	2.60	.9953
−1.80	.0359	−0.98	.1635	−0.16	.4365	0.66	.7454	1.46	.9279	2.65	.9960
−1.78	.0375	−0.96	.1685	−0.14	.4443	0.68	.7518	1.48	.9306	2.70	.9965
−1.76	.0392	−0.94	.1736	−0.12	.4523	0.70	.7580	1.50	.9332	2.75	.9970
−1.74	.0409	−0.92	.1788	−0.10	.4602	0.72	.7642	1.52	.9357	2.80	.9974
−1.72	.0427	−0.90	.1841	−0.08	.4681	0.74	.7704	1.54	.9382	2.85	.9978
−1.70	.0446	−0.88	.1894	−0.06	.4761	0.76	.7764	1.56	.9406	2.90	.9981
−1.68	.0465	−0.86	.1949	−0.04	.4841	0.78	.7823	1.58	.9429	2.95	.9984
−1.66	.0485	−0.84	.2005	−0.02	.4920	0.80	.7882	1.60	.9452	3.00	.9986
−1.64	.0505	−0.82	.2061	0.00	.5000	0.82	.7939	1.62	.9474	3.05	.9989
−1.62	.0526	−0.80	.2119	0.02	.5080	0.84	.7996	1.64	.9495		
−1.60	.0548	−0.78	.2177	0.04	.5160						

This table shows the probability [$N(d)$] of observing a value less than or equal to d. For example, as illustrated, if d is −.24, then $N(d)$ is .4052.

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